Reg. No.:

Name :

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MID TERM EXAMINATIONS – April 2023

Programme	:	**B.Tech.**	Semester	:	**Summer 2022-23**
Course Title/ Course Code	:	**Applied Numerical Methods / MAT2003**	Slot	:	**C21+C22+C23+C24+C25**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1		Solve the following system of equations by Gauss elimination method with the concept of partial pivoting. $$\begin{bmatrix} 2 & 2 & 1 \\ 4 & 2 & 3 \\ -1 & 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$	**10**
2		Derive the rate of convergence of Gauss-Seidel method for the following system of equations $$\begin{aligned} -3x + y &= 2 \\ 2x - 4y + z &= 0 \\ 2y - 3z &= -1 \end{aligned}$$	**10**
3		Write any two differences between direct method and iterative method. Derive the order of convergence of following iterative method. $x_{n+1} = \frac{x_n}{2} + \frac{a}{x_n}$ converges to $a\sqrt{2}$.	**10**
4		Approximate a positive root of equation $10 \int_0^x e^{-x^2}\, dt - 1 = 0$, correct up to four decimal places using secant method.	**10**
5		Approximate the $f(1.2)$ and $f(2.8)$ using Newton divided difference interpolation. Here f is given by the following data.	**10**

x	0	1	3	6
$f(x)$	1	4	39	250

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